

**BCRA 2017, 10<sup>th</sup> International Conference on the  
Bearing Capacity of Roads, Railways and Airfields  
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**Toll Road PPP's: A tool for innovation  
promoting cost-efficiency through  
high-quality pavements**

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1st Vice President, ASECAP  
Chief Executive Officer, Attikes Diadromes S.A.**

# Roads and Concessions

Roads are used to move the majority of people and freight across Europe:

72% of passenger traffic is moved by car.

45% of freight is moved by trucks.

Road Network requires big investments.

State budgets are limited. A proven alternative is road Concessions.

*A Concession is a kind of Public–Private Partnership (PPP) under which a public authority (Concession Authority) grants specific long term rights to a private or semi-public organization (Concessionaire), to construct, overhaul, maintain and operate an infrastructure (\*).*

# HELLENIC ASSOCIATION TOLL ROAD NETWORK



Attiki Odos



Rio – Antirio bridge



Egnatia Odos



Nea Odos



Moreas



Aegean



Olympia Odos



Kentriki Odos

# The Greek Toll Road Network



## 7 Private companies – Concessionaires

- Attiki Odos (Attica Tollway)
- Gefyra (Rion – Antirion Bridge)
- Nea Odos
- Moreas Motorway
- Aegean Motorway
- Olympia Odos
- Kentriki Odos

## 1 Public Company

- Egnatia Odos



# Objectives and goals of HELLASTRON

HELLASTRON is a professional, scientific, educational and research association and operates on a non-for-profit basis. Indicatively, the objectives of HELLASTRON are:

- In relation to the users: the continuous improvement of the services provided to the users of toll roads.
- In relation to the research and public benefit: the investigation, promotion and development of the scientific aspects related to road transportation, **road pavement**, construction and maintenance of roads and networks.
- In relation to the promotion of road transportation: the participation in similar associations, worldwide.
- In relation to the interests of the members of the Company: the protection and promotion of the interests of the toll road infrastructures sector.

(Excerpts from the Association's Bylaws)

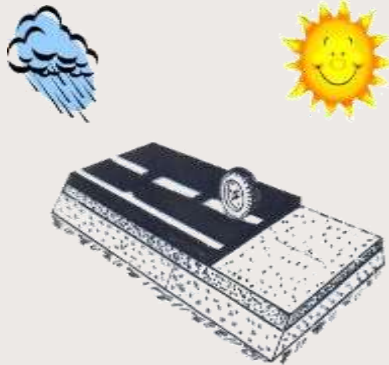
# HELLASTRON - Key Figures (2016)

| Code    | 2016 Data                                       | Egnatia Odos | Attiki Odos | Olympia Odos | Moreas | Aegean Motorway | Kentriki Odos | Nea Odos | Gefyra | TOTAL   |
|---------|---|--------------|-------------|--------------|--------|-----------------|---------------|----------|--------|---------|
| INFO 1  | Total Network Length (km)                       | 885,3        | 70          | 202,3        | 205    | 256,2           | 231           | 377,6    | 3,5    | 2.230,9 |
| INFO 2  | Length in Construction (km)                     | 31,2         | 0           | 120          | 0      | 25,6            | 174           | 157,3    | 0      | 508,1   |
| INFO 3  | Length in Operation (km)                        | 854,1        | 70          | 202,3        | 205    | 230,6           | 57            | 220,3    | 3,5    | 1.842,8 |
| STAFF 1 | Total Staff                                     | 650          | 950         | 2.539        | 414    | 986             | 757           | 1.793    | 92     | 8.181   |
| STAFF 2 | Staff in Concession & Operation                 | 650          | 950         | 455          | 311    | 469             | 119           | 321      | 92     | 3.367   |
| TOLL 11 | Total Number of Toll Transactions (in millions) | 29,09        | 77,04       | 34,29        | 16,42  | 21,26           | 7,17          | 24,18    | 3,46   | 212,91  |
| REV 1   | Annual Toll Revenues (mil €, without VAT)       | 56,70        | 170,65      | 65,85        | 30,75  | 55,72           | 11,60         | 76,05    | 36,33  | 503,65  |
| TRAF 3  | Heavy Good Vehicles Percentage (%)              | 14,7         | 4,0         | 11,9         | 8,6    | 23,1            | 17,4          | 13,5     | 13,9   | -       |
| TRAF 4  | Vehicle Kilometers Travelled (mil)              | 2.930        | 1.271       | 1.518        | 517    | 755             | 173           | 1.230    | 12,1   | 8.407   |

# ASECAP - Members



# Pavements: Life Cycle and affecting factors



**Pavement Condition deteriorates over the lifetime of the pavement because of specific affecting factors.**

**Factors affecting pavement deterioration**



Traffic flow

+



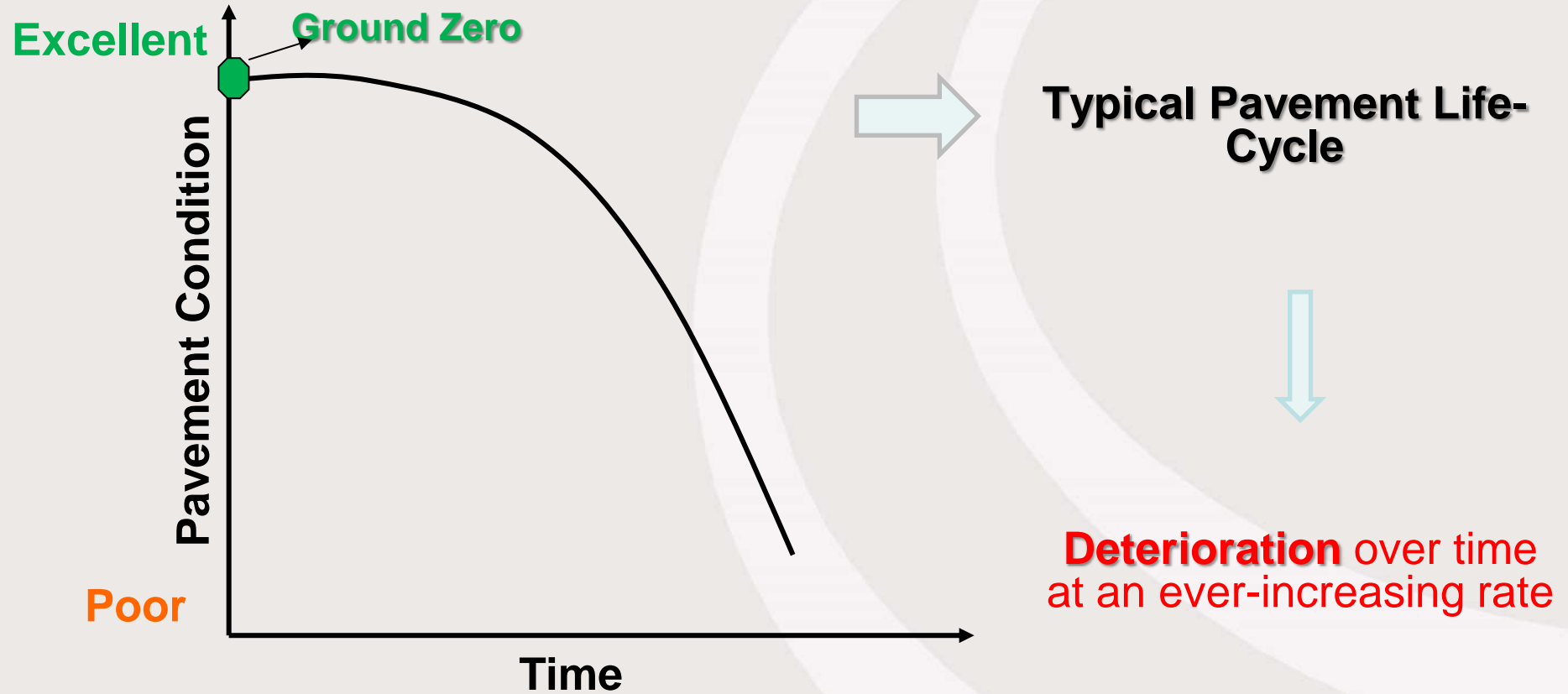
Low availability of funds



Increasing deterioration rate

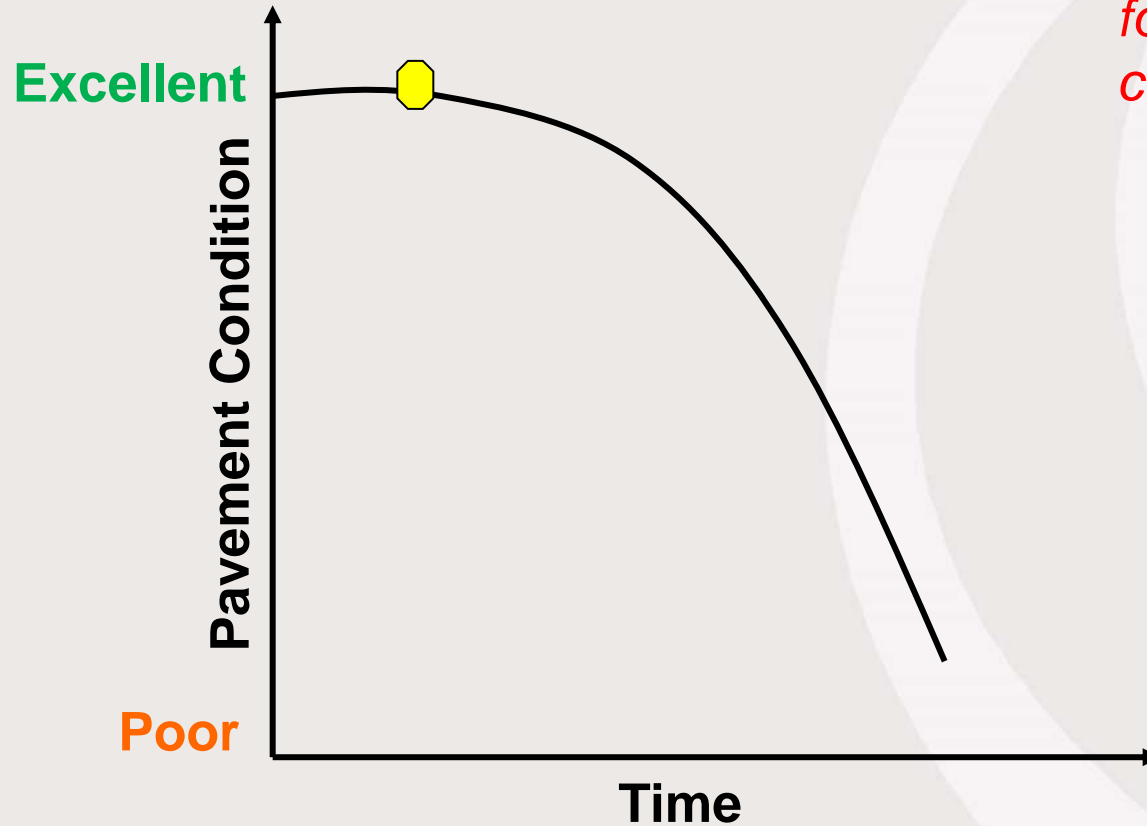


# Pavement Life Cycle

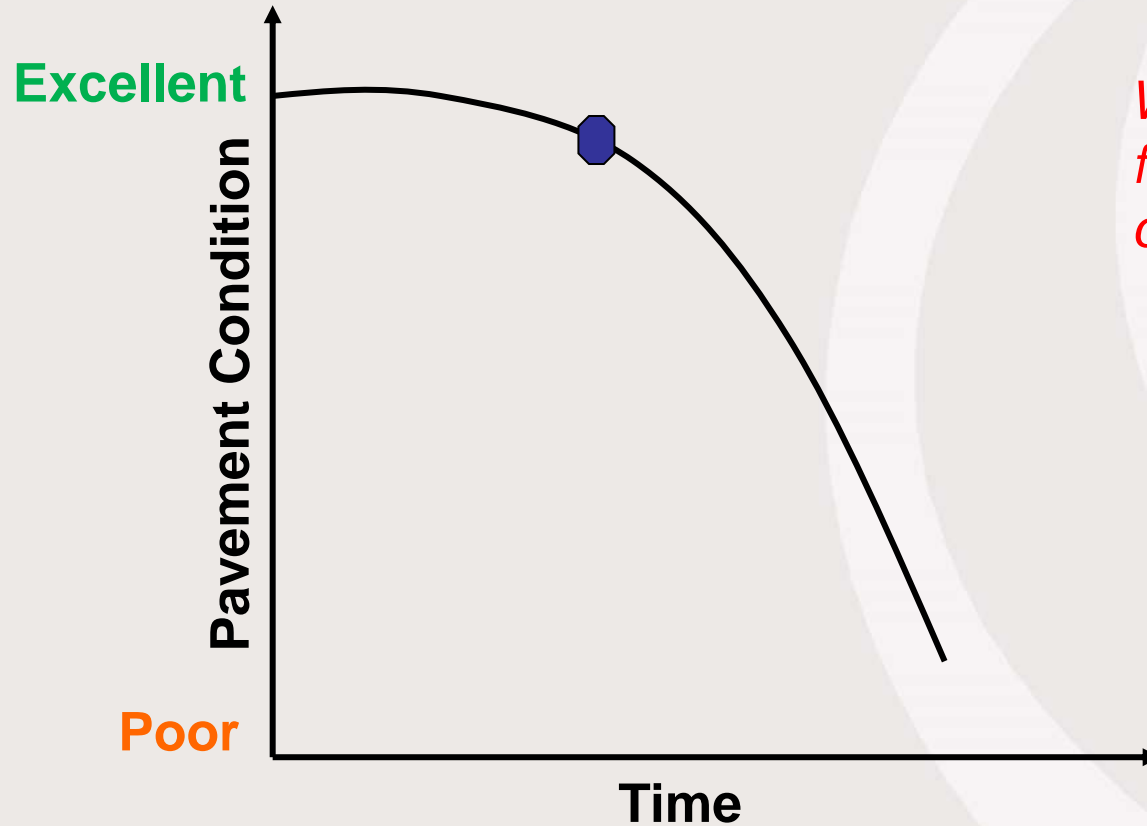


# Pavement Life Cycle

*When it's time to intervene  
for improving pavement  
condition?*

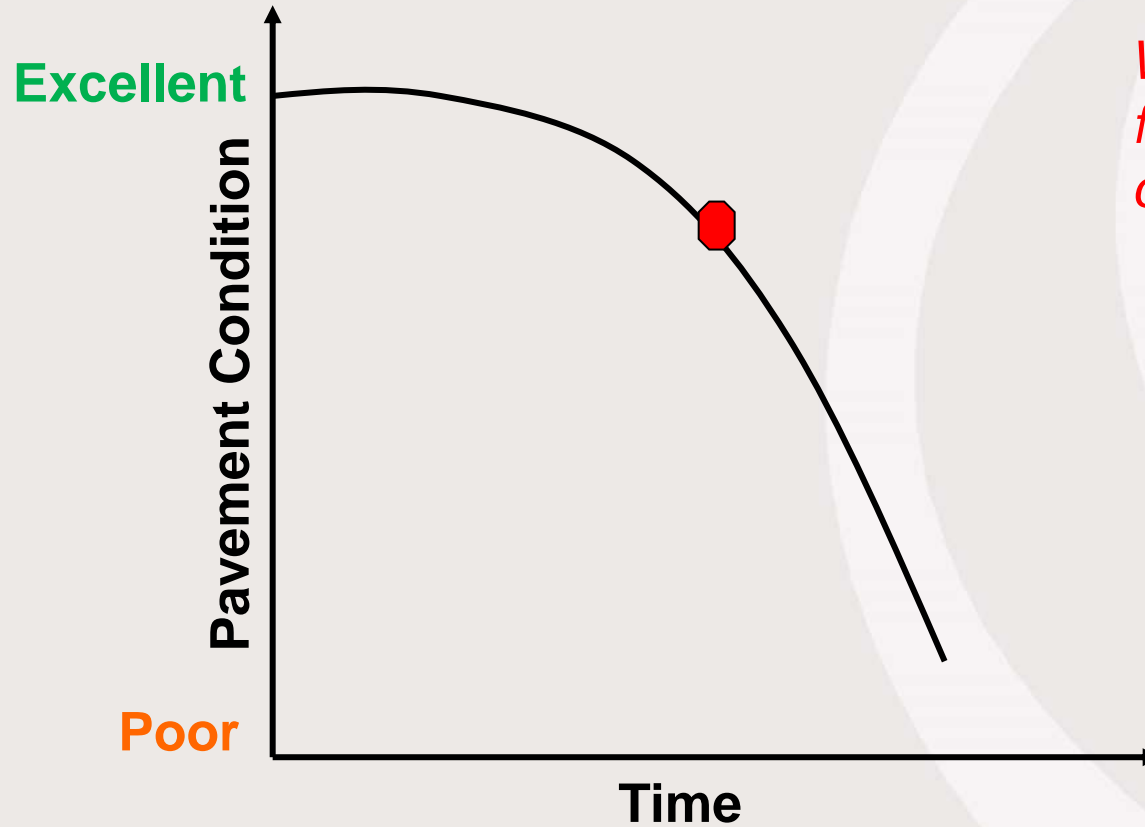


# Pavement Life Cycle



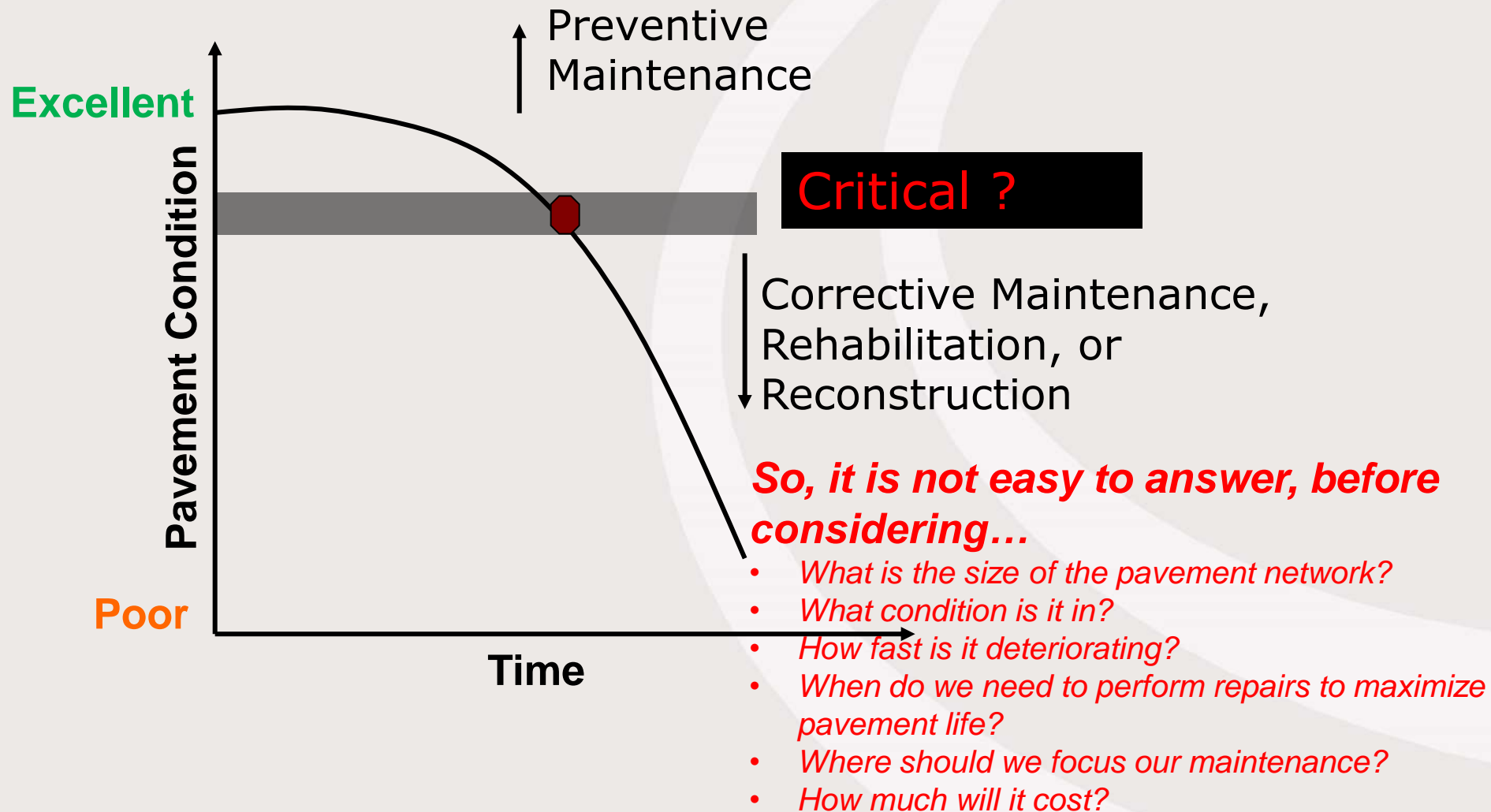
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# Pavement Life Cycle



*When it's time to intervene  
for improving pavement  
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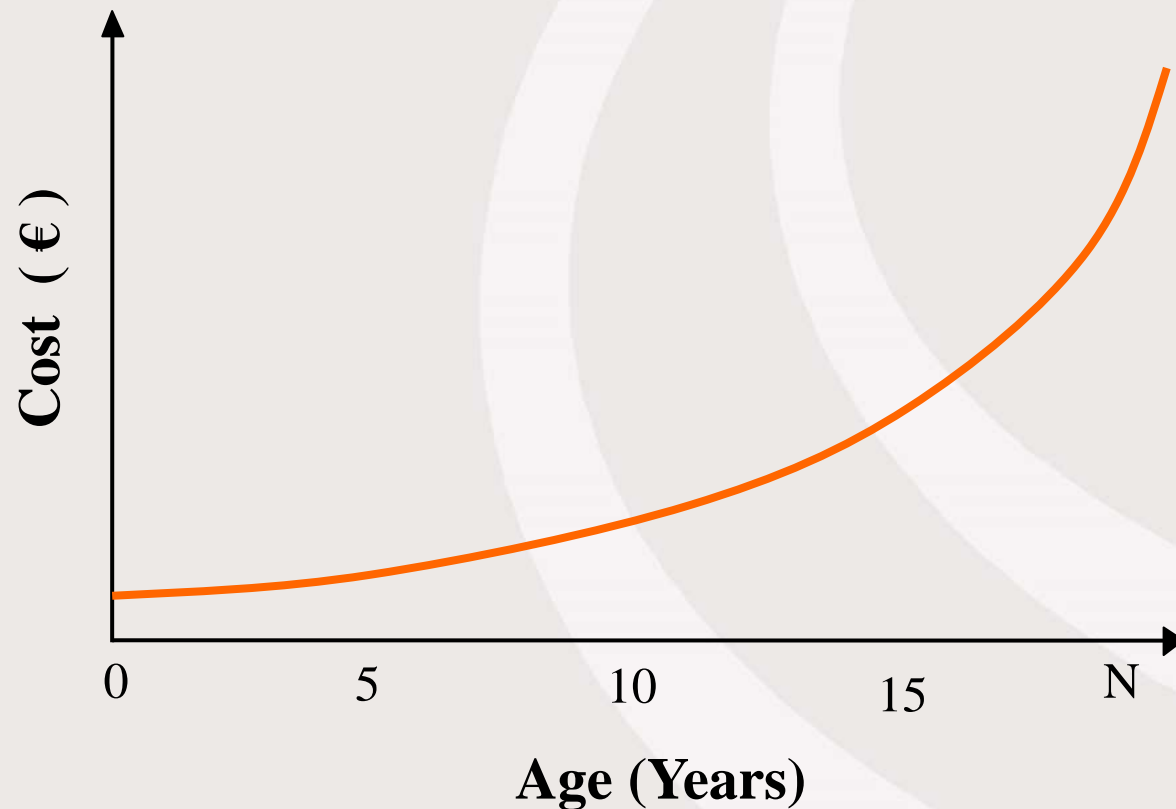
# Pavement Life Cycle



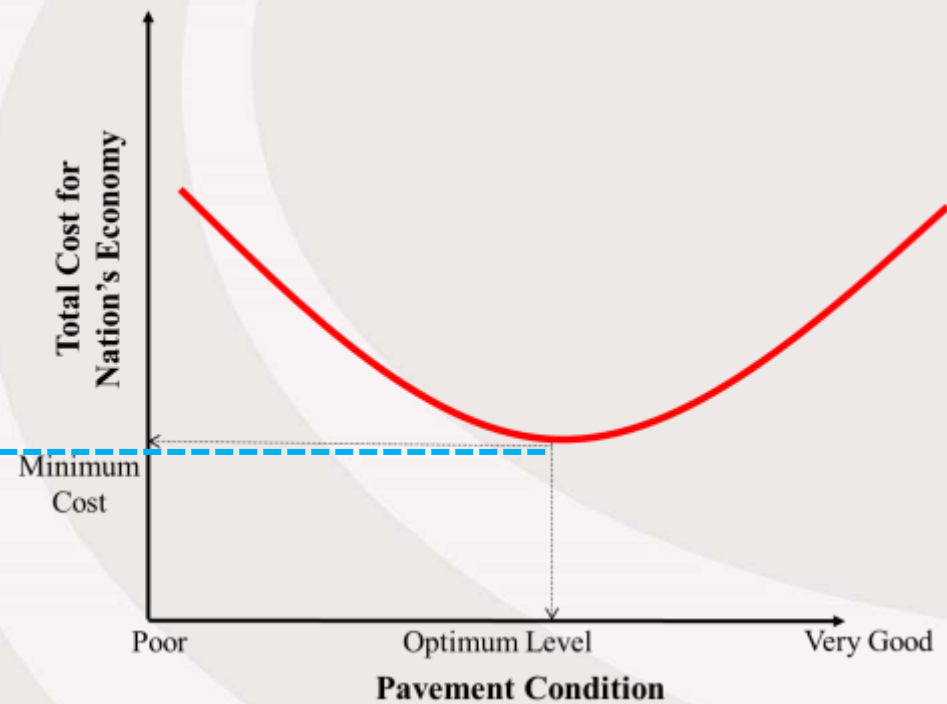
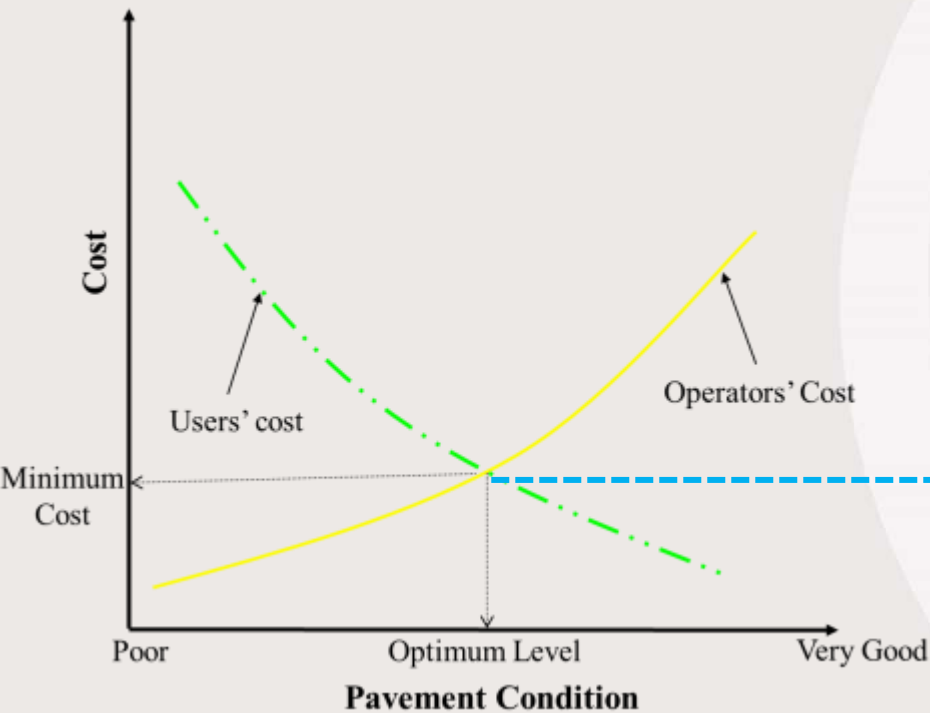


# Efficient Pavement Management System (1)

## Maintenance cost



## Efficient Pavement Management System (2)



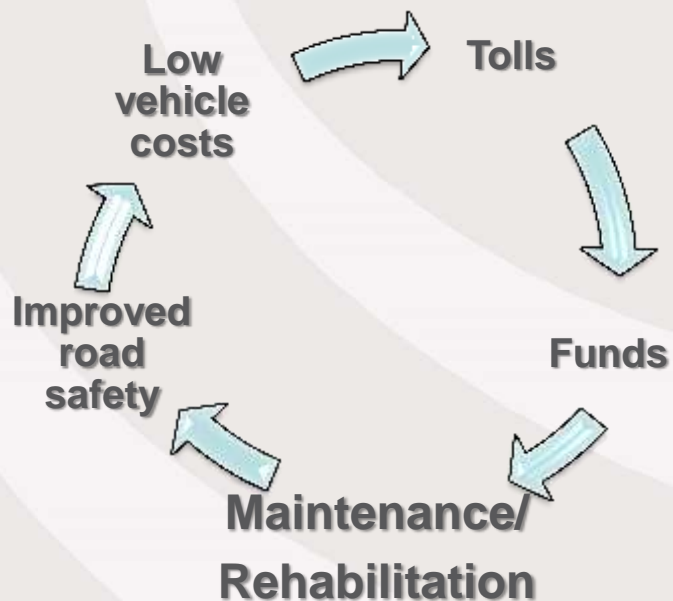
# Pavement Life Cycle Analysis

In the case of toll roads, efficient allocation of funding is of paramount importance:

- To organize maintenance/rehabilitation
- Extend pavement lifetime.

With the view to:

- Improving driving safety
- Increasing users' satisfaction

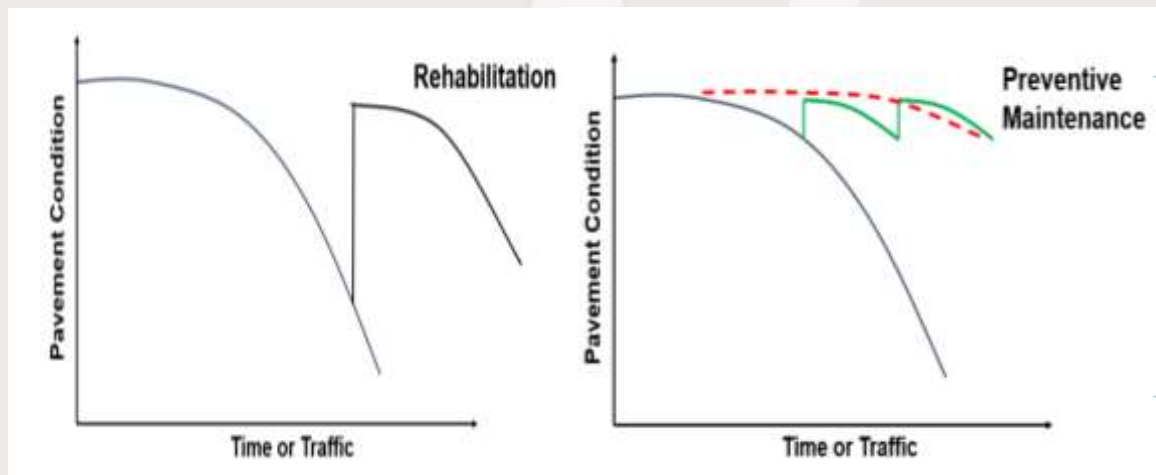


# Pavement assessment

**Main target → Providing safety to users and ride quality**

✓ **Total Pavement Assessment**

- ✓ Need for proactive maintenance and/or rehabilitation when needed
- ✓ Effective allocation funding coming from tolls, for organizing maintenance/rehabilitation



**Pavement  
lifetime  
extension**

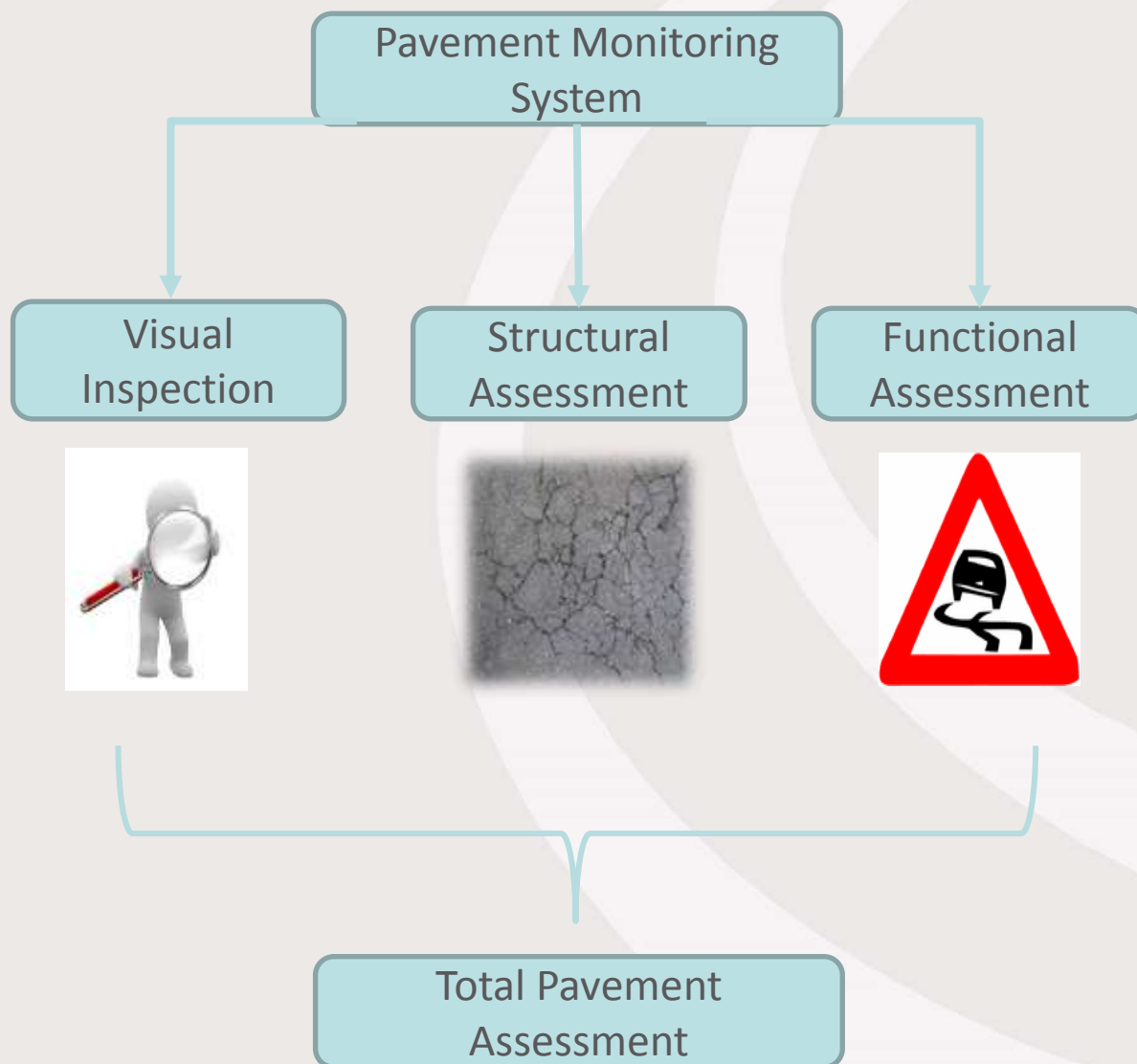


**Long Life  
Pavements (LLP)**



**High Quality  
Pavements**

# Pavement Monitoring System for Total Assessment





# ΑΤΤΙΚΗ ΟΔΟΣ ATTICA TOLLWAY



Centerline: 70 Kms

Length: 140 Kms (bidirectional)

39 Toll Stations/ 195 Toll Gates (95 ETC capable)

12,5 km of tunnels and cut & cover sections (9% of length)

Daily Entries 2016: 210.492 veh/day

OMC: Operation and  
Maintenance Center

TB: Technical Base

# **Pavement Conditions Monitoring in Attica Tollway**

**Operator and Concessionaire team up with  
National Technical University**

## **Data Collection**



**Database Development**

**Analysis**

**Assessment**

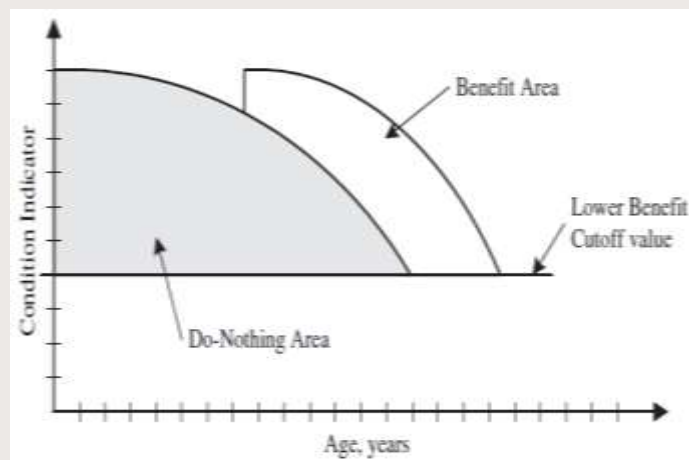
**Pavement Preservation**



## **Attica Tollway. The facts**

- **25 years concession for finance, design, build, operate and maintain a greenfield toll motorway**
- **1st Section opened 03/2001, all Sections 06/2004**
- **Offer assumed resurfacing every seven years**
- **Life cycle cost for pavements was introduced during the design and construction phase**
- **Innovative design extended intervention time to more than 10 years.**
- **Continuous semiannual monitoring, so that timing, nature and extend of intervention is determined early.**

# Pavement Preservation



## Pavement Preservation:

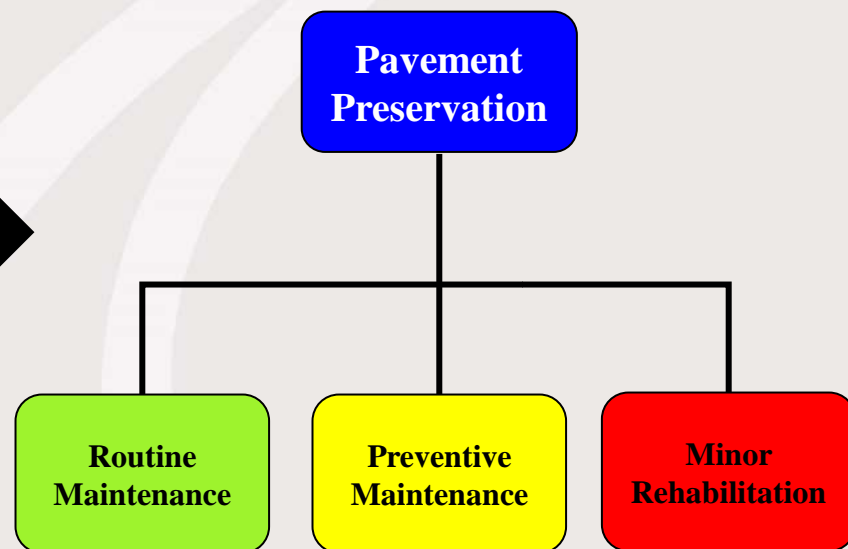
- ✓ Improves the overall condition of the pavement network
- ✓ Extends pavement life
- ✓ Reduces user delays
- ✓ Improves road safety
- ✓ SAVES MONEY



Various methods and techniques



Need for sustainable solutions



*What's new?*

*Many issues to be discussed...*

***Thank you!***



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